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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,607

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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT

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2881

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/583,607	<b>Applicant(s)</b> NISHIKAWA ET AL.	
	<b>Examiner</b> PHILLIP A. JOHNSTON	<b>Art Unit</b> 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

***Detailed Action***

1. This Office Action is submitted in response to the RCE filed 8-23-2010, wherein claims 14 and 20 have been amended. Claims 1-14 are pending.

***Response to Arguments***

2. The applicant's argument filed 8-23-2010 are not persuasive, particularly regarding the statement that Davis fails to disclose the newly amended limitation of claim 14 that states;

"a first optical system that forms an intermediate image of the primary image surface; and  
a second optical system having a concave reflector that forms a secondary image corresponding to the secondary image surface according to the intermediate image."

The examiner disagrees, because as interpreted from Figure 3 in Davis, the first optical system can include lens set 34a, concave mirror 34b and lens set 34c, which forms an intermediate image at the intermediate image plane, while the second optical system also includes concave mirror 34b and the components of Projection Lens 37, which are used to form a secondary image on a screen (the secondary image surface).

It is important to point out here that one of ordinary skill in the art recognizes that each of the first and second optical systems above are defined by the collection of optical elements used in a particular configuration, and would include sharing certain elements between them such as a common mirror in order to provide a folded light path.

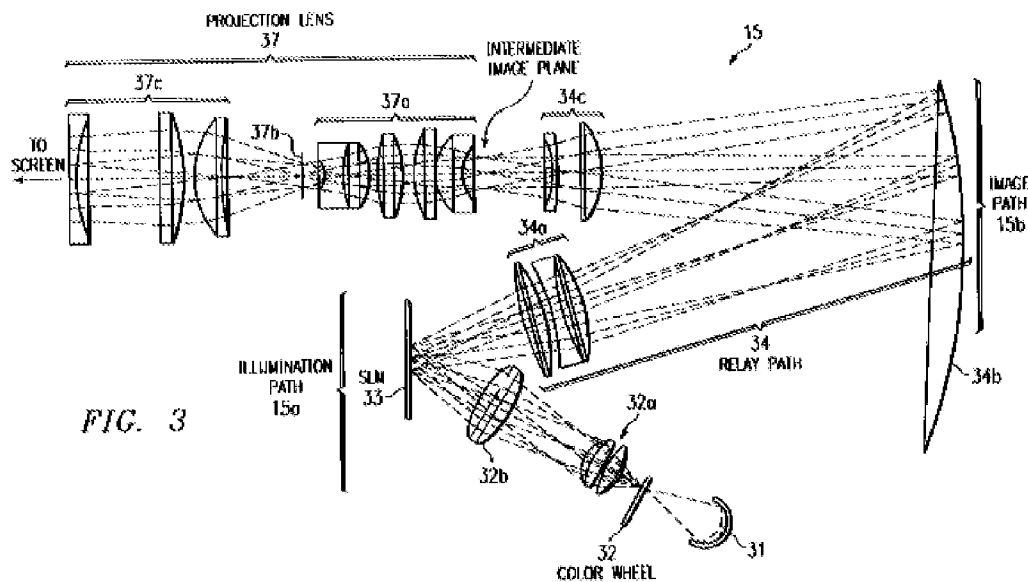
***Claims Rejection - 35 U.S. C. 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 14 is rejected under 35 U.S.C. 102 (b) as being anticipated by Davis, U. S. Patent No. 6,619, 804.

5. Regarding claim 14, Davis discloses at Col. 3, line 38-67; and Col. 4, line 1-33; the projection display apparatus shown below in Figure 3 that includes the following;



(a) Light source 31,

(b) Modulator SLM 33 that modulates the light source based on digitized video signals. See Col. 3, line 22-37

(c) A first optical system that includes the following optical elements; lens set 34a, concave mirror 34b and lens set 34c, which forms an intermediate image of SLM 33 (the primary image surface) at the intermediate image plane, of lenses 34a as shown in Figure 3 above. Col. 4, line 16-33,

(d) A second optical system that also utilizes concave mirror 34b and the optical elements of Projection Lens 37 (note Figure 3 above) to create an image on the display system screen (the secondary image surface). Col. 4, line 16-33,

(e) An optical path represented by the three ray bundles shown in Figure 3 above, which reflect from the center and extremities of modulator SLM 33 (the primary imaging surface Col. 1, line 27-43), where the light first crosses the optical axis in light path 34 then reflects off the concave mirror 34b and crosses the optical axis again at the intermediate image plane then travels through the projection optics to the screen (the secondary image surface). See Col. 3, line 38-67; and Col. 4, line 1-33.

### ***Claims Rejection – 35 U.S.C. 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 14, and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiller, USPN, 6,233,024, in view of Davis, 6,619,804, and in further view of Cotton, USPN 6719,430.

8. Regarding claim 14, Hiller teaches a video projection system at Col. 7, line 10-63 and shown in Figure 1 below including projection assembly 1 that contains a light source; optics and a modulator for scanning a light bundle in two dimensions off a plane mirror 3 to a screen 2.

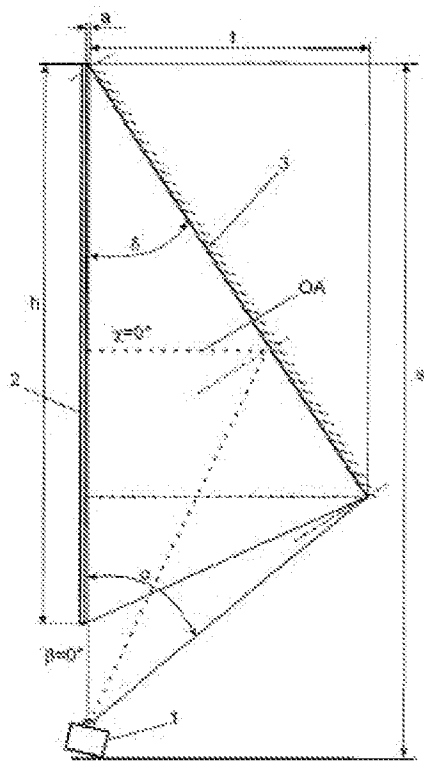


Fig. 1

9. Hiller fails to teach a projection optical system for enlarged projection from a primary image surface toward the modulation means to a secondary image surface toward a screen, wherein the projection optical system includes: a first optical system that forms an intermediate image of the primary image surface; and a second optical system having a concave reflector that forms a secondary image corresponding to the secondary image surface according to the intermediate image, wherein a light beam travels from the center of the primary image surface to the center of the secondary image surface, crosses an optical axis of the first optical system, reflects on the concave reflector, crosses the optical axis again, and reaches the secondary image surface.

Davis discloses a projection display apparatus shown above in Figure 3 that includes the following;

(c) A first optical system that includes the following optical elements; lens set 34a, concave mirror 34b and lens set 34c, which forms an intermediate image of SLM 33 (the primary image surface) at the intermediate image plane, of lenses 34a as shown in Figure 3 above. Col. 4, line 16-33,

(d) A second optical system that also utilizes concave mirror 34b and the optical elements of Projection Lens 37 (note Figure 3 above) to create an image on the display system screen (the secondary image surface). Col. 4, line 16-33,

(c) An optical path represented by the three ray bundles shown in Figure 3 above, which reflect from the center and extremities of modulator SLM 33 (the primary imaging surface Col. 1, line 27-43), where the light first crosses the optical axis in light path 34 then reflects off the concave mirror 34b and crosses the optical axis again at the intermediate image plane then travels through the projection optics to the screen (the secondary image surface). See Col. 3, line 38-67; and Col. 4, line 1-33.

Davis modifies Hiller to provide an optical engine that provides for a high contrast, telecentric, on-axis image by a relay path between the modulator and the projection lens, where the relay path places the image at an intermediate image plane accessible by a projection lens.

Hiller teaches a cabinet containing a large mirror for deflecting an image onto the screen mounted at the front of the cabinet from a projector mounted at the rear of the cabinet. See Abstract.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that Hiller would use the optical engine of Davis to provide a modulation

based projection optical apparatus that combines characteristics of both telecentric and non-telecentric designs in order to provide a display having optimum contrast. Col. 2, line 24-31.

10. Regarding claims 16 and 17, Hiller discloses at Col. 7, line 10-35; and line 55-63 a screen disposed in a housing or cabinet as shown in Figure 1 above having a video picture reflected onto the back of the screen from a plane mirror at the top of the cabinet via an optical system located at the bottom of the cabinet, where the viewer is located in front of the screen, which one of ordinary skill recognizes would require a transmissive screen.

11. Regarding claims 18 and 19, Hiller discloses at col. 4, line; and col. 5, line 1-4, a screen and a Fresnel lens whose object-side focal point is imaged in the exit pupil of the magnification optics or of the deflecting device and whose Fresnel structure lies on the light entrance side considered in the direction of light, followed by a disk for vertical and horizontal scattering.

12. Regarding claim 20, Hiller discloses at Col. 5, line 5-23, a plane reflector positioned immediately before the screen and optimizing the projected image with respect to the size of the cabinet by varying the angle  $\delta$  between the screen and the plane reflector while varying the deflection angle  $\alpha$  between the screen and light beam furthest from (outmost) the screen, which one of ordinary skill recognizes that the angular relationship of Hiller would include the claimed angular range for the tangent of angle  $\alpha$ .

13. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiller, USPN, 6,233,024, in view of Davis, 6,619,804, and in further view of Cotton, USPN 6,719,430.



14. Regarding claim 15, the combination of Hiller and Davis discloses all limitations of claim 15, as described above regarding claim 14, but fails to disclose first and second optical systems having rotationally symmetric optical surfaces.

Cotton discloses the use of substantially rotationally symmetric lens groups in a projection display apparatus. Col. 8, line 46-50.

Cotton modifies the combination of Hiller and Davis to provide rotationally symmetric optical elements for the correction of optical aberrations in a projection system while maintaining the ability to produce an image on a tilted image plane that is corrected for anamorphic distortion.

Hiller teaches a rear projector optical system where the optical path is folded via a large mirror in order to provide a video projector that has a small housing depth. Col. 1, line 30-35.

Therefore it would have been obvious to one of ordinary skill in the art that the combination of Hiller and Davis would use the rotationally symmetric optical surfaces of Cotton, in order to spread out the optical power of the cylindrical elements thereby providing an optical system having a reduced optical path that produces an accurate image on a screen, which does not suffer from improperly focused images and image distortions. Col. 2, line 28-36.

### ***Conclusion***

15. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:30 pm. If attempts to

reach the examiner by telephone are unsuccessful, the examiners supervisor Robert Kim can be reached at (571)272-2293. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

January 28, 2011

/Phillip A Johnston/

Primary Examiner, Art Unit 2881

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